

ABSTRACT OF THE DISCLOSURE

A flow responsive dump valve mechanism for a straddle packer tool and has a valve controlled flow passage from which underflushed fluid, typically well treatment slurry, in a conveyance and fluid supplying tubing string can be dumped into a well casing. The dump valve mechanism incorporates a ratcheting power piston, an indexing mechanism and high and low load energy storage systems to accomplish open, closed and intermediate dump valve positions. The intermediate position increases the functionality of the tool by preventing accidental closure either due to the free fall of fluid through the coiled tubing or during flushing of the tool and permits the flow rate to be increased for thorough cleaning of the straddle tool and coiled tubing. For energy storage, a light compression spring provides power to cycle the indexing mechanism. Heavier load disc springs (Bellville Washers) are used to provide power for the ratcheting power piston to open the valve.